

AMENDMENTS TO THE CLAIMS

1-46. (canceled)

47. (currently amended) A recombinant adenovirus comprising:

a first HIV sequence encoding a mutated HIV envelope protein ~~first HIV antigen~~, expression of which is under the transcriptional control of a first promoter; and

a second HIV sequence encoding a second HIV antigen, expression of which is under the transcriptional control of a second promoter, expression of the first and second HIV sequences eliciting an immune response directed against the first and second HIV antigens upon infection of the host by the recombinant virus.

48. (original) The recombinant adenovirus of claim 47, wherein the recombinant adenovirus is replication-incompetent.

49. (original) The recombinant adenovirus of claim 47, wherein the first and second HIV antigens are the same.

50. (original) The recombinant adenovirus of claim 47, wherein the first and second HIV antigens are different.

51. (canceled)

52. (currently amended) The recombinant adenovirus of claim ~~47~~ 51, wherein said ~~the~~ HIV envelope protein is selected from the group consisting of a wild-type or mutant gp160, mutant gp120, or and mutant gp41.

53. (currently amended) The recombinant adenovirus of claim 52, wherein said gp160 protein is mutated by deleting the cleavage site between gp120 and gp41 ~~the cleavage site of the HIV envelope protein is inactivated by mutation.~~

54. (currently amended) The recombinant adenovirus of claim ~~53~~ 52, wherein said gp160 protein is further mutated by deleting the C-terminal cytosolic domain of the HIV envelope protein is deleted.

55. (currently amended) The recombinant adenovirus of claim ~~54~~ 52, wherein said C-terminal cytosolic domain is 100 amino acids in length both the cleavage site and the C-terminal cytosolic domain of the HIV envelope protein are deleted.

56. (currently amended) The recombinant adenovirus of claim ~~47~~ 51, wherein the first or second HIV sequence further encodes an HIV regulatory protein selected from the group consisting of Tat, Vif, Nef, and Rev.

57. (currently amended) The recombinant adenovirus of claim 47, wherein said mutated the first or second HIV antigen is a modified HIV envelope protein contains that includes multiclade variable loops that are heterologous to a native progenitor of the recombinant adenovirus.

58. (currently amended) The recombinant adenovirus of claim 57, wherein said the multiclade variable loops are V3 loops from at least two HIV clades.

59. (currently amended) The recombinant adenovirus of claim 58, wherein said V3 loop is from the at least two HIV clades are selected from the group consisting of clade A, B, C, D, E, F, and G of group M of HIV-1 isolates.

60. (original) The recombinant adenovirus of claim 58, wherein the V3 loops are encoded by polynucleotides selected from the group consisting of SEQ ID NOs: 25, 26, 27, 28, 29, 30, and 31.

61. (original) The recombinant adenovirus of claim 47, further comprising:

a polynucleotide encoding a signal peptide that facilitates the secretion of the first or second HIV antigen by a cell infected by the recombinant adenovirus.

62. (original) The recombinant adenovirus of claim 61, wherein the signal peptide is an HIV gp120 signal peptide.

63. (original) The recombinant adenovirus of claim 61, wherein the signal peptide is encoded by SEQ ID NO: 74.

64. (original) The recombinant adenovirus of claim 47, further comprising:
a polynucleotide encoding an membrane-anchoring domain that renders the first or second HIV antigen bound to the surface of a cell infected by a cell infected by the recombinant adenovirus.

65. (original) The recombinant adenovirus of claim 64, wherein the membrane-anchoring domain is an HIV gp41 transmembrane domain.

66. (original) The recombinant adenovirus of claim 64, wherein the membrane-anchoring domain is encoded by SEQ ID NO: 75.

67-76. (canceled)

77. (currently amended) The recombinant adenovirus of claim 47, wherein said envelope protein is mutated by deleting a region selected from the group consisting of V1 region, V2 region, and V1 and V2 regions. ~~both the first and second HIV antigen are a wild type or mutant HIV envelope protein.~~

78. (canceled)

79. (original) The recombinant adenovirus of claim 47, further comprising:

an immuno-stimulator sequence heterologous to adenovirus and encoding an immuo-stimulator whose expression in the host enhances the immunogenicity of the first or second HIV antigen.

80. (original) The recombinant adenovirus of claim 79, wherein the first or second HIV sequence and the immuno-stimulatory sequence are expressed from the same promoter bicistronically via an internal ribosomal entry site or via a splicing donor-acceptor mechanism.

81. (original) The recombinant adenovirus of claim 79, wherein the immuno-stimulator is a cytokine.

82. (original) The recombinant adenovirus of claim 81, wherein the cytokine is selected from the group consisting of interleukin-2, interleukin-4, interleukin-12, b-interferon, a-interferon, g-interferon, granulocyte colony stimulating factor, and granulocyte-macrophage colony stimulating factor.

83. (original) The recombinant adenovirus of claim 47, wherein the first or second promoter is an adenoviral promoter.

84. (original) The recombinant adenovirus of claim 47, wherein the first or second promoter is non-adenoviral promoter.

85. (original) The recombinant adenovirus of claim 84, wherein the non-adenoviral promoter is selected from the group consisting of CMV promoter, SV40 promoter, retrovirus LTR promoter, and chicken cytoplasmic b-actin promoter.

86. (original) The recombinant adenovirus of claim 47, wherein the first promoter is in the E1 region of the adenovirus and the second promoter is positioned in the E4 region of the adenovirus.

87-98. (canceled)